

# OBSERVATIONS ON THE HOOKLETS OF *CYSTICERCUS CELLULOSAE* IN MAN

BY

J. W. W. STEPHENS, M.D., CANTAB, D.P.H.,  
WALTER MYERS LECTURER IN TROPICAL MEDICINE

(Received for publication 23 April, 1909)

In May, 1908, Drs. Campbell and Thomson, of Jammalamadagu, Madras, kindly presented to the museum a specimen of *Cysticercus cellulosae* in the pectoral muscle of man. The size of the connective

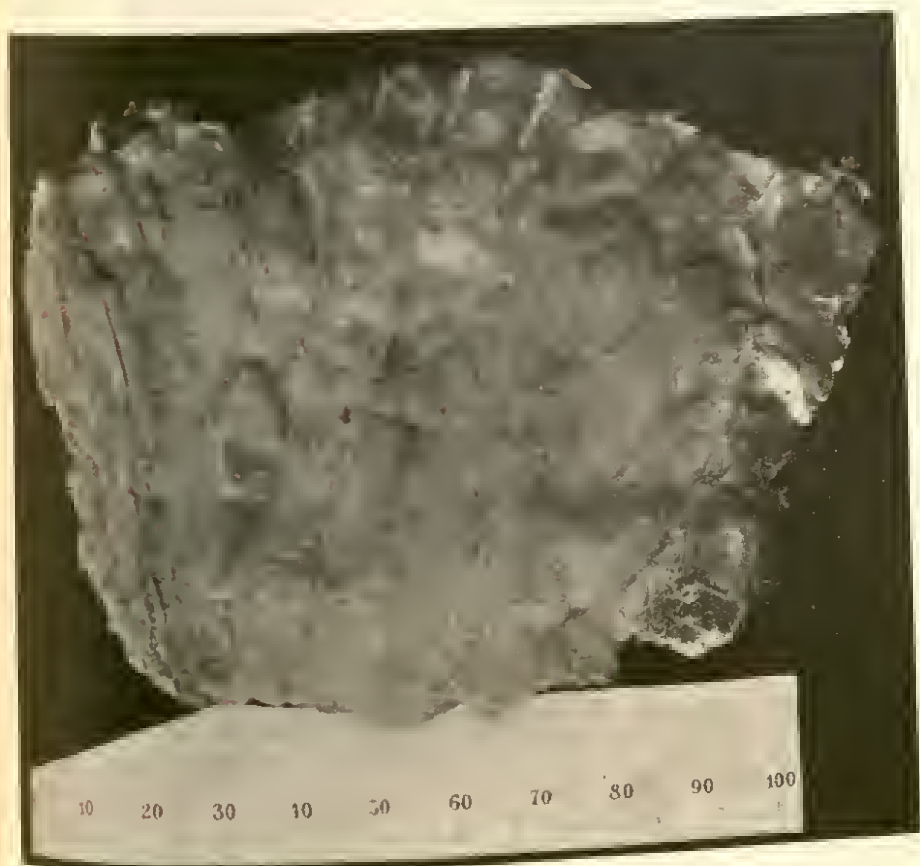


FIG. 1. *Cysticercus cellulosae*. Pectoral muscle of man. Natural size.

tissue capsules of the cysts varied from 15-21 mm. long by 8-10 mm. broad (fig. 1). Recently I proceeded to examine a scolex extracted from its bladder with a view to making certain of the diagnosis. I was surprised accordingly, on examining a specimen, to find only sixteen hooklets instead of twenty-two to thirty-two, which is the number given by various authorities as comprising the limits of variation. It was possible that one circle of hooklets was absent, but on measuring, this explanation, taken also in connection with what will appear later, is hardly possible.



FIG. 2.—Circle of hooklets of the same.  $\times 80$  approximately.

1. *Pectoral cysticercus* (fig. 2). Sixteen hooklets. The size of the hooks varied from  $108.0(?)\mu$ - $144.0\mu$ . As will be seen from the appended protocols, there was no sharp demarcation between small and large hooks, but hooklets of various sizes also occurred, e.g.,  $126.6\mu$ ,  $129.6\mu$ ,  $133.2\mu$ ,  $136.8\mu$ .

2. *Pectoral cysticercus*. Twenty-one hooklets found. The range of variation was in this case greater, viz., from  $104.4$ - $122.4\mu$  for what might be called small hooks, and from  $154.8$ - $165.6\mu$  for the large.

3. *Pectoral cysticercus*. Hooklets twenty. Only a few hooks were measured, three small, varying from  $108\cdot0$ - $111\cdot6\mu$ , and five large, varying from  $144\cdot0$ - $151\cdot2\mu$ .

4. *Pectoral cysticercus*. Twenty hooklets. In this case, as in case No. 1, it is hardly possible to separate the hooks into a large and small series, as hooks of an intermediate size occur. Thus hooks of the following sizes were measured  $122\cdot5$ ,  $129\cdot5$ ,  $133\cdot0$ ,  $140$ ,  $143\cdot5$ ,  $147\cdot0$ ,  $150\cdot5$ ,  $153\cdot5\mu$ .

I next examined a specimen of *C. cellulosa* from the brain and a specimen from the tongue; both from natives of Madras and presented



FIG. 3.—*Cysticercus cellulosa* from brain.  $\times 80$  approximately.

to the museum by Major Williams, I.M.S., and compared them with the hooks of *T. solium* in man and *C. cellulosa* from the pig.

5. *Brain cysticercus* (fig. 3). Hooklets twenty-eight. The 'small' range from  $104\cdot6$ - $118\cdot8\mu$ ; the 'large' from  $151\cdot2$ - $162\cdot0\mu$ , so that there is a fairly well marked line of separation.

6. *Tongue cysticercus* (fig. 4). One month's duration. Hooklets twenty-two (? two missing). The small range from  $108\cdot0$ - $122\cdot4\mu$ . The large from  $140\cdot4$ - $151\cdot2\mu$ . The range of variation is not so great,

nor is the line of separation between the small and large so marked as in the brain cysticercus.

7. *Pig muscle cysticercus*. Twenty-five hooklets found. Ten hooklets were measured. The size of the small was constant, viz.,  $126\mu$ . That of the large was also constant, viz.,  $175\mu$ , so that separation between large and small was quite distinct.



FIG. 4.—*Cysticercus cellulosae* from tongue.  $\times 80$  approximately.

8. *T. solium*. Twenty-five hooklets were found. Eighteen of these were measured. The small range from  $115.2-140.4\mu$  and the large from  $183.6-187.2\mu$ , so that the line of separation is again distinct, though it is noticeable that the size of the hooklets is distinctly larger than in the case of the cysticercus in the pig's muscle.

It would appear, therefore, from these observations that in *C. cellulosae* in man there is an irregularity of development affecting both the number of the hooklets and, more especially, their size.

1	2	3	4	5	6	7	8
<i>T. solium</i> Hooklets 25	Brain cyst. Hooklets 28	Tongue cyst Hooklets 22 (? 24)	Pectoral cyst 1. Hooklets 16	Pectoral cyst 2 Hooklets 21	Pectoral cyst 3. Hooklets 20	Pectoral cyst 4. Hooklets 20	<i>G. cellulosae</i> from pig's muscle. Hooklets 25
1. 115.2	1. 104.6	1. 108.0	1. 108.0	1. 104.4	1. 108.0	1. 122.5	1. 175
2. 118.8	2. 108.0	2. 108.0	2. 126.6	2. 108.0	2. 108.0	2. 129.5	2. 126
3. 118.8	3. 108.0(?)	3. 108.0	3. 126.6	3. 111.6	3. 111.6	3. 129.5	3. 175
4. 122.4	4. 108.0	4. 111.6	4. 126.6	4. 118.8	4. 118.8	4. 133.0	4. 175
5. 122.4	5. 108.0	5. 111.6	5. 126.6	5. 118.8	5. 118.8	7. 140.0	5. 175
6. 122.4	6. 108.0	6. 115.2	6. 129.6	6. 118.8	6. 129.6	8. 140.0	6. 126
7. 125.6	7. 108.0	7. 115.2	7. 129.6	7. 122.4	7. 129.6	9. 143.5	7. 126
8. 136.8	8. 108.0	8. 115.2	8. 133.2	8. 133.2	7. 151.2	11. 147.0	8. 175
9. 136.8	9. 111.6	9. 115.2	9. 133.2	8. 154.8	8. 151.2	12. 150.5	9. 126
10. 140.4	10. 115.2	10. 118.8	10. 133.2	9. 154.8	Small 108.0-111.6	12. 150.5	10. 175
	11. 115.2	11. 118.8	11. 133.2	10. 154.8	Large 144.0-151.2	13. 150.5	
	12. 115.2	12. 122.4	12. 136.8	11. 154.8		14. 150.5	Small 126 $\mu$
	13. 118.8		13. 136.8	12. 154.8		16. 150.5	Large 175 $\mu$
	14. 118.8	13. 140.4	14. 144.0	13. 154.8		17. 150.5	
		14. 144.0	15. 144.0	14. 154.8		18. 150.5	
		15. 144.0		15. 154.8		18. 153.5	
	15. 151.2	16. 147.6		16. 154.8			
	16. 154.8	17. 147.6		17. 158.4		Small 122.5-136.5	
	17. 154.8	18. 147.6		18. 162.0		Large 142-153.5	
	18. 154.8	19. 147.6		19. 162.0			
	19. 154.8	20. 147.6		20. 165.6			
	20. 154.8	21. 147.6					
Small 115.2-140.4	21. 158.4	22. 151.2		Small 104.4-122.4			
Large 183.6-187.2	22. 158.4			Large 154.8-165.6			
	23. 158.4						
	24. 158.4	Small 108.0-122.4					
	25. 158.4	Large 140.4-151.2					
	26. 158.4						
	27. 162.0						
	28. 162.0						
	Small 104.6-118.8						
	Large 151.2-162.0						